

REMARKS

In view of the above amendments and following remarks, reconsideration and further examination are requested.

Attached hereto is a marked-up version of the pages of the specification to which changes have been made by the current Amendment. The attached pages are captioned "Version with Markings to Show Changes Made."

Proposed drawing amendments shown in red for Figs. 3A and 3B , along with formal drawings incorporating these proposed amendments are provided. The Examiner's approval of these proposed drawing amendments is solicited.

The instant invention pertains to a method for determining a printing state of material on a substrate. Preferably, the substrate comprises a circuit board and the material comprises solder. It is important that the solder be applied to the circuit board in a reliable and non-defective manner such that electronic components can be securely mounted to the circuit board via the solder. Accordingly, it is important to ensure that the solder is printed or applied to the circuit board in a non-defective manner. One way to ensure that the solder is printed or applied to the circuit board in a non-defective manner is to examine all of the locations of the circuit board to which solder has been applied. However, this results in a time-consuming operation, and accordingly, there is a need in the art to reliably determine, in a time-efficient manner, whether solder has been applied to a circuit board in a non-defective manner.

Applicants have met this need by providing a unique method for determining when solder has been properly applied to a circuit board in a non-defective manner. Specifically, the method includes printing solder onto a require portion of a circuit board and also onto a test portion of the circuit board. The test portion corresponds to an area of the circuit board that is at higher risk of resulting in a defect of the solder when the solder is printed thereon than is the required portion of the circuit board. Also, the solder

is printed onto the test portion of the circuit board under a condition that has a higher risk of resulting in a defect of the solder when printed on the test portion than does a condition under which the solder is printed onto the required portion. Then, the printing state of the solder printed onto the required portion of the circuit board is judged by inspecting the printing state of the solder printed onto the test portion. Claim 20 is believed to be representative of Applicants' inventive method.

In section 6 on page 2 of the Office Action, the Examiner rejected claims 1-3 under 35 U.S.C. 102(b) as being anticipated by JP '991. And in Section 7 on pages 2-3 of the Office Action, the Examiner rejected claim 1 under 35 U.S.C. 102(b) as being anticipated by Stemme. These rejections are respectfully traversed and JP '991 and Stemme are not applicable with regard to the newly added claims for the following reasons.

Claim 20 recites a method for determining a printing state of material on a substrate, comprising

printing material onto a required portion of a substrate and a test portion of said substrate ... wherein said test portion corresponds to an area of said substrate that is at high risk of resulting in a defect of said material when printed thereon ... and wherein said material is printed onto said test portion under a condition that has a high risk of resulting in a defect of said material when printed on said test portion ... and judging a printing state of said material printed onto said required portion by inspecting a printing state of said material printed onto said test portion. (Emphasis added)

Such a method is not taught or suggested by either one of JP '991 or Stemme.

In this regard, JP '991 discloses a method for inspecting a printing state of material on a substrate. The substrate 15 includes a pattern 6 of the material. Of this pattern 6, sub-pattern 14 corresponds to a pattern that is supposedly printed under the most severe

conditions. Also provided on the substrate 15 is a pattern 8, which corresponds in printing conditions to that of the sub-pattern 14.

However, contrary to what is recited in claim 20, JP '991 does not disclose or suggest that the test portion, i.e. that portion of the substrate 15 on which pattern 8 is printed, corresponds to an "area that is at high risk" of resulting in a defect of the material when printed thereon. Similarly, JP '991 does not disclose or suggest that the material constituting pattern 8 is printed onto the substrate under a "condition that has a high risk" of resulting in a defect of the material when printed on the substrate. While pattern 8 corresponds to pattern 14, which is said to be printed under the most severe condition, this most severe condition does not necessarily correlate to a "high risk" condition. Accordingly, claim 20 is not anticipated by JP '991.

Furthermore, claims 37, 38, 42 and 43 have been added more specifically define the test portion and the condition under which the material is printed thereon. Specifically, claim 37 recites that

said test portion corresponds to an area of high risk by
corresponding to an area of said substrate that is at a
**higher risk of resulting in a defect of said material when
printed thereon than is said required portion when said
material is printed thereon** (Emphasis added)

The area of the substrate of JP '991 on which pattern 8 is printed is not described to be any different than the area of the substrate on which pattern 14 is printed. Accordingly, the area of the substrate 15 on which pattern 8 is printed is **not** at a "higher risk" of resulting in a defect of the printed material than is the area of the substrate on which pattern 14 is printed. Accordingly, claim 37 is patentable in its own right over JP '991.

Claim 38 further limits claim 37 and recites that the test portion corresponds to **an area of said substrate that is located outside of said required portion and along a peripheral edge of said substrate**. In JP '991 the pattern 8 is shown to be in the same general vicinity as the pattern 14, and is not located along a peripheral edge of the substrate. Accordingly, claim 38 is also patentable in its own right over JP '991.

With regard to claim 42, this claim recites that

said material is printed onto said test portion under a condition that has a high risk of resulting in a defect ... by printing said material under a condition that is at a higher risk of resulting in a defect of said material ... than is a condition under which said material is printed on said required portion (Emphasis added)

In JP '991, pattern 8 is printed under the same condition as pattern 14, and accordingly, the condition under which pattern 8 is printed is **not** at a "higher risk" of resulting in a defect than is a condition under which pattern 14 is printed. Accordingly, claim 42 is patentable in its own right over JP '991.

Claim 43 further limits claim 42, and recites that the "higher risk" as recited in claim 42 is realized by **printing said material onto a location of said test portion that is smaller in size than any location of said required portion onto which said material is printed**. In JP '991, the individual locations of patterns 8 and pattern 14 are equal in size, and accordingly, the subject matter of claim 43 is not taught or suggested by JP '991. Please see the attached partial translated of JP '991. Thus, claim 43 is patentable in its own right over JP '991.

Thus, claims 20-44 are allowable over JP '991.

Stemme discloses a method to determine where a blur occurred with regard to imaging process steps of photocopy. In other words, the purpose of Stemme is to determine whether the blur occurred in the camera or in a following developmental step.

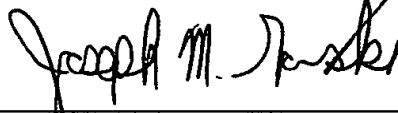
The "test pattern" of Stemme is used to identify where a blur occurred and not to judge a printing state of the remainder of the photograph. Accordingly, Stemme does not anticipate claim 20. Thus, claims 20-44 are allowable over Stemme.

In view of the above amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and an early Notice of Allowance is earnestly solicited.

If after reviewing this Amendment, the Examiner believes that any issues remain which must be resolved before the application can be passed to issue, the Examiner is invited to contact the Applicants' undersigned representative by telephone to resolve such issues.

Respectfully submitted,

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